BONE MARROW CHANGES IN MYCOSIS FUNGOIDES*

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In 1806 Alibert (1) reported the first case of mycosis fungoides. He believed the disease to be an unusual form of yaws and originally applied the name "Pian Fungoide" to it. In 1835 Alibert (2) corrected his error and introduced the present term mycosis fungoides. Following these original cases the condition was studied extensively. Pathologic studies were first reported by Gillot and Ronvier (3). They concluded that the disease was primarily one of the lymphoid tissue. Keim (4) in 1924 proposed that mycosis fungoides be classified as one of the lymphoblastomas. This suggestion has been followed by the majority of writers. Weidman (5) stated that the lymphoblastomas should be studied from the hematologic viewpoint in order that the specific cell type involved in the neoplastic process might be determined.

Such diagnostic technics have been employed at the University of Virginia Hospital (6). The diagnosis in these cases was established on the basis of typical clinical findings, in association with certain histologic findings. The slides were reviewed by several dermatopathologists. Attempts were made to exclude the other lymphoblastomas. Lymph node biopsies were done whenever possible.

DISCUSSION

Eosinophilic myelocytes are normally found in the bone marrow as well as in the peripheral blood. They are also found in the segmented form. Kracke (7) stated that the differential count of sternal marrow will reveal 0.3–2.0% eosinophilic myelocytes and 0.1–1% segmented eosinophils. Other texts state that the percentage of eosinophils in the normal marrow varies from 0.5% to 6%. Numerous causes of blood eosinophilia have been enumerated, according to Bray (8) they may be classed under the following broad headings; diseases of the blood forming organs, allergic conditions, parasitic diseases, skin diseases, certain infectious diseases, following certain drugs and in association with malignancies. The skin diseases in which eosinophilia is frequently found are those associated with severe pruritus. Pemphigus and dermatitis herpetiformis frequently have a persistent eosinophilia. An eosinophilia is also seen in 15% of cases of Hodgkins disease. Wintrobe (9) stated that the degree of eosinophilia seemed to parrallel the extent of the cutaneous involvement regardless of the nature of the disease. According to Weidman (10) and Lewis (11) the significance of the eosinophilia seen in cutaneous disorders is not known. Peripheral blood eosinophilia as high as 25% has been reported in mycosis fungoides according to Kirk (12).

Plasma cells are found normally in the bone marrow but rarely exceed 2 per cent of the total white cell series. In certain unspecified skin disease, Wintrobe

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(9) found plasma cells in the peripheral blood. Monocytes are found normally in the bone marrow, the percentage being 0.5–5.0%.

Lapiere and DeWeerdt (13) reported a series of 11 patients in the various stages of mycosis fungoides. The bone marrow changes were reported in great detail and compared with normal marrows. The authors found that in mycosis fungoides the bone marrow exhibited a reticulo-endothelial reaction. In five of the eleven cases the sum of the percentages obtained for the reticulo-endothelial

TABLE 1

*Differential counts on bone marrow smears from 6 cases of mycosis fungoides**

CASE DATE	1 1-44	1† 1-47	2‡ 7-47	3 11-47	3 4-48	3 9-48	4§ 11-47	5 12-48	6 3-48
Myeloblasts	2	0	0.6	0	0	2		0	2
Promyelocytes	5	2	2.6	1	0	0		2	3
Neutrophilic myelocytes	15	2.5	16.6	0	2	7		24	10.5
Eosinophilic myelocytes	0.5	1	3.0	0	0.5	0		9.5	1.5
Basophilic myelocytes	0	0	0	0	0	0		0	0
Juvenile forms	10	0	15.3	7	0	4		10	13
Band forms	25	0	38.3	45	5	5		29	28.5
Segmented forms	23	48.5	16.3	38	52.5	50		10	14.5
Eosinophiles	1.5	9	5.0	0	6	4		10	5
Basophils	0.5	4	0	0	0	0		1	0
Lymphocytes	7	11	1	5	17	18		3	7.5
Monocytes	1	13	0	0	7	0		0	0
Plasma cells	0.5	0	0.3	4	2	0		1	3
Reticulo-endothelial cells	1.5	0	0.3	0	0	0		0	0
Degenerate	6.5	0	0	0	8	10		0	11.5
Abnormal lymphocytoid cells	2	7	0	0	0	0		0	0
M/E	2.1/1	4.6/1	3.6/1	3.5/1	12/1	3.6/1		7.4/1	3.3/1
Number counted	200	200	200	200	200	100			200

* Marrows tabulated were studied by the Dept. of Clinical Pathology and by the division of Hematology of the Dept. of Internal Med., Univ. of Va. Hospital. Reports from other sources were available in Cases #1 & 2 but these are not tabulated.

† A report on this case from Univ. of Penn. on Aug. 22, 1947 showed slight increase in cellularity and some increase in plasma cells.

‡ A report on this case from Memorial Hospital, N. Y. C. in April 1948 "Normally cellular marrow with some shift to left".

§ Differential not available. Marrow reported as being normal.

cells, monoblasts, lymphocytes and plasma cells varied from 5% to 10%. In 4 of the cases it exceeded 10%, the highest being 20%. The sum of these elements in the average normal marrow was 4%. Santoianni (14) reported similar changes in four patients. In two of the 11 cases reported by Lapiere and DeWeerdt, hypoplasia of the erythrocytes was found. They considered this due to toxins elaborated in the skin. There was also a slight inhibition of the maturation of the neutrophilic myelocytes in one of their cases. An increase in the eosinophils of the sternal marrow with or without a blood eosinophilia was also observed. This dissociation between blood and sternal marrows was also observed by Lapiere in malignant lymphogranulomas.

Lapiere and DeWeerdt (13) concluded that the sternal marrow in mycosis fungoides was typical in that a reticuloendothelial reaction was noted. This reaction was not consistent and the authors felt should not be considered specific until it could be shown to exist only in mycosis fungoides. Besides the reticuloendothelial or polymorphic histioid reaction the authors noted an inconstant eosinophilia alone or with blood eosinophilia, an inhibition in the transformation of metamyelocytes to neutrophilic leucocytes and disturbances in the maturation of red cells.

Tzanck et al. (15) noted in their 6 cases a high proportion of cells belonging to the reticular system and a small number of histiocytes peculiar to mycosis fungoides. Lapiere did not find these special histiocytes.

The accompanying table shows the marrow findings in 6 cases of mycosis fungoides. In 3 cases specimens were obtained on several occasions. No attempt was made to correlate the studies on the bone marrow and the peripheral blood. The peripheral blood eosinophilia varied from 0 to 40%. Atypical and degenerative lymphocytes and plasma cells were noted in the blood of several patients, but these changes were not striking. Leukemia was found terminally in one case and in all cases the other lymphoblastomas were ruled out by appropriate studies.

The percentage of lymphocytes in the marrow varied from 1% to 18%, the average being 8.6%. Abnormal lymphocytoid cells were noted in case one. The plasma cells varied from 0% to 4%, the average being 1.5%. Monocytes were found in two instances, and reticulo-endothelial cells were also found in two cases. The eosinophils varied from 0 to 10%, the average being 5.0%. Eosinophilic myelocytes were found in percentages ranging from 0 to 9.5%, the average being 2%. Degenerative cells were observed in 4 instances. An erythrocytic hypoplasia was found in two patients, but in one of these, another specimen showed normal erythropoiesis.

In Case 1 it is noted that the percentage of lymphocytes remained fairly constant in two observations at the University of Virginia and in one observation elsewhere. Case 2 was reported by one hospital as having had a normally cellular marrow with some shift to the left, but at another hospital the marrow was reported as that seen in lymphatic leukemia. In 3 marrows studied from Case 3 the lymphocytes were reported as being consistently elevated and on two instances a high percentage of degenerative cells was seen. Thus we find that the only persistent abnormality in the sternal marrows examined was the presence of a slight increase in the number of lymphocytes. An eosinophilia was observed in some cases but this was neither persistent for the individual case nor found in all cases. Abnormal lymphocytoid cells and degenerative cells were also observed, but these findings were not seen in all cases.

CONCLUSIONS

1. Observations on bone marrow smears from 6 cases of mycosis fungoides failed to confirm the presence of a reticulo-endothelial reaction.
2. A slight increase in the lymphocytes was noted.
3. An eosinophilia was observed in some cases but this was not persistent.

4. Degenerative and abnormal lymphocytoid cells were noted in several cases.
5. The above changes are not specific for mycosis fungoides.

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